



INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Substitute for form 1449A/PTO

Sheet 1 of 1
(use as many sheets as necessary)

Complete if Known
Application Number 10/669,135
Filing Date September 23, 2003
First Named Inventor Milan Kokta
Group Art Unit
Examiner Name
Attorney Docket Number 1035-BI4307

U.S. PATENT DOCUMENTS

Examiner Initials *	Cite No. 1	U.S. Patent Document Number	Kind Code 2 (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
m	AA	4,493,720		Gauthier, et al.	01/15/1995	
	AB	5,644,400		Mundt	07/01/1997	
	AC	5,768,335		Shahid	06/16/1998	
	AD	5,825,913		Rostami, et al.	10/20/1998	
	AE	5,822,213		Huynh	10/13/1998	
	AF	6,021,380		Fredriksen, et al.	02/01/2000	
ms	AG	4,819,167		Cheng, et al.	04/04/1989	
	AH					
	AI					
	AJ					

FOREIGN PATENT DOCUMENTS

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PUBLICATIONS

Examiner Initials *	Cite No. 1	Title of Publication	Date of Publication of Cited Document MM-DD-YYYY
	AW		
	AX		
	AY		
	AZ		

Examiner Signature	<i>Mathy</i>	Date Considered	<i>4/19/05</i>
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m)	AA	3,655,439		SEITER	04/11/1972	
	AB	3,658,586		WANG	04/25/1972	
	AC	3,796,597		V.R. PORTER, et al.	03/12/1974	
	AD	4,177,321		NISHIZAWA	12/04/1979	
	AE	5,741,724		RAMDANI, et al.	04/21/1998	
	AF	5,850,410		KURAMATA	12/15/1998	
	AG	5,530,267		BRANDLE, JR., et al.	06/25/1996	
	AH	6,104,529		BRANDLE, JR., et al.	08/15/2000	
	AI	3,883,313		CULLEN, et al.	05/13/1975	
	AJ	5,802,083		BIRNBAUM	09/01/1998	
m)	AK	2003/0007520	A1	KOKTA, et al.	01/09/2003	

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	AL	EP	0 148 656	A1	AUZEL, et al.	11/16/1984		<input type="checkbox"/>
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PUBLICATIONS

Examiner Initials *	Cite No. 1	Title of Publication	Date of Publication of Cited Document MM-DD-YYYY
m)	AV	YUMASHEV K.V., et al., "Co ²⁺ -doped spinels saturable absorber Q-switches for 1.3-1.6 μ m solid state lasers", OSA TRENDS IN OPTICS AND PHOTONICS. ADVANCED SOLID STATE LASERS., Vol. 34, pp. 236-239, 2000. XP008017966	
m)	AW	YUMASHEV, K.V., et al., "Passive Q-switching of 1.34- μ m neodymium laser using Co ²⁺ :LiGa ₅ O ₈ and Co ²⁺ :MgAl ₂ O ₄ ", CONFERENCE DIGEST, 2000, 1 page. XP002242959	
m)	AX	OKTYABRSKY, S., et al., "Crystal structure and defects in nitrogen-deficient GaN", MRS Internet J. Nitride Semicond. Res, G6.43, pp. 1-6, 1999.	
	AY	KLEBER, W., et al., "Zur epitaxie von galliumnitrid auf nichtstochiometrischem spinell im system GaCl/NH ₃ /He". CRYSTAL RESEARCH AND TECHNOLOGY, Vol. 10, No. 7, pp. 747-758, 1975. (English Abstract)	
	AZ	SEIFERT, A., "Nachweis von stapelfehlern in GaN-epitaxieschichten mittels elektronenbeugung", CRYSTAL RESEARCH AND TECHNOLOGY, Vol. 10, No. 7, pp. 741-746, 1975. (English Abstract)	
Examiner Signature	Matt J		Date Considered 4/24/05

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M	BA	6,533,874	B1	VAUDO, et al.	03/18/2003	
M	BB	4,627,064		AUZEL, et al.	12/02/1986	
M	BC	4,000,977		FALCKENBERG	01/04/1977	
	BD					
	BE					
	BF					
	BG					
	BH					
	BI					
	BJ					
	BK					

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	BL							<input type="checkbox"/>
	BM							<input type="checkbox"/>

PUBLICATIONS

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M	BW	OHSATO, H., et al., "Epitaxial orientation and a growth model of (0 0 • 1) GaN thin film on (1 1 1) spinel substrate", JOURNAL OF CRYSTAL GROWTH, Vol. 189/190, pp. 202-207, 1998.	
I	BX	YANG, H. -F., et al., "Microstructure evolution of GaN buffer layer on MgAl ₂ O ₄ substrate", JOURNAL OF CRYSTAL GROWTH, Vol. 193, pp. 478-483, 1998.	
I	BY	DUAN, S., et al., "MOVPE growth of GaN and LED on (1 1 1) MgAl ₂ O ₄ ", JOURNAL OF CRYSTAL GROWTH, Vol. 189/190, pp. 197-201, 1998.	
M	BZ	SHELDON, R., et al., "Cation Disorder and Vacancy Distribution in Nonstoichiometric Magnesium Aluminate Spinel, MgO • Al ₂ O ₃ ", J. AM. CERAM. SOC., Vol. 82, No. 12, pp. 3293-3298, 1999.	
Examiner Signature	Mab J		
Date Considered	4/29/05		

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Attorney Docket Number 1035-BI4307

Sheet 3 of 3

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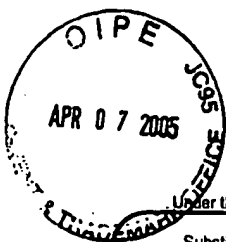
PUBLICATIONS

Examiner Initials *	Cite No.1	Title of Publication	Date of Publication of Cited Document MM-DD-YYYY
M	AAA	KULESHOV, N.V., et al., "Co-doped spinels: promising materials for solid state lasers", LONGER WAVELENGTH LASERS AND APPLICATIONS, Vol. 2138, pp. 175-182, 1994. XP008017848	
	AAB	KULESHOV, N.V., et al., "Absorption and luminescence of tetrahedral Co ²⁺ ion in MgAl ₂ O ₄ , Vol. 55, no. 5-6, pp. 265-269, 1993. XP008017849	
	AAC	NIKISHIN, S.A., et al., "Gas source molecular beam epitaxy of GaN with hydrazine on spinel substrates", APPLIED PHYSICS LETTERS, Vol. 72, No. 19, pp. 2361-2363, 1998. XP000755963	
	AAD	HAISMA, et al., "Lattice constant adaptable crystallographics", JOURNAL OF CRYSTAL GROWTH, Vol. 102, pp. 979-993, 1990. XP002250056	
	AAE	TAMURA, K., et al., "Epitaxial growth of ZnO film on lattice-matched ScAlMgO ₄ (0001) substrates", JOURNAL OF CRYSTAL GROWTH, Vol. 214-215, pp. 59-62, 2000. XP004200964	
	AAF	WYON, et al., "Czochralski growth and optical properties of magnesium-aluminum spinel doped with nickel", JOURNAL OF CRYSTAL GROWTH, Vol. 79, pp. 710-713, 1986. XP002250057	
	AAG	TSUCHIYA, T., et al., "Epitaxial growth of InN films on MgAl ₂ O ₄ (1 1 1) substrates", JOURNAL OF CRYSTAL GROWTH, Vol. 220, pp. 185-190, 2000.	
	AAH	KURAMATA, Akito, et al., "High-quality GaN epitaxial layer grown by metalorganic vapor phase epitaxy on (111) MgAl ₂ O ₄ substrate", APPL. PHYS. LETT., Vol. 67, No. 17, pp. 2521-2523, 1995.	
	AAI	MITCHELL, T., "Dislocations and Mechanical Properties of MgO- MgAl ₂ O ₃ spinel single crystals", J. AM. CERAM. SOC., Vol. 82, No. 12, pp. 3305-3316, 1999.	
	AAJ	HELLMAN, E., "Exotic and Mundane substrates for gallium nitride heteroepitaxy", BELL LABORATORIES, THC2, Murray Hill, NJ.	
	AAK	KRUGER, M.B., et al., "Equation of state of MgAl ₂ O ₄ spinel to 65 GPa", THE AMERICAN PHYSICAL SOCIETY, Vol. 56, No. 1, pp. 1-4, 1997.	
	AAL	KURAMATA, A., et al., "Properties of GaN epitaxial layer grown on (111) MgAl ₂ O ₄ substrate", SOLID-STATE ELECTRONICS, Vol. 41, No. 2, pp. 251-254, 1997.	
M	AAM	GRITSYNA, V., et al., "Structure and Electronic states of defects in spinel of different compositions MgO · n MgAl ₂ O ₃ · Me", J. AM. CERAM. SOC. Vol. 82, No. 1, pp. 3365-3373, 1999.	
Examiner Signature	Matt X		Date Considered 4/27/95

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STATEMENT BY APPLICANT**

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Sheet 1 of 3

Complete if Known

Application Number	10/669,135
Filing Date	September 23, 2003
First Named Inventor	Milan Kokta
Art Unit	1722
Examiner Name	Matthew J. Song
Attorney Docket Number	1035-BI4307

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
M)	AA	US- 3,625,868	12/07/1971	Grabmaier et al.	
	AB	US- 3,736,158	05/29/1973	Cullen et al.	
	AC	US- 3,816,906	06/18/1974	Falckenberg	
	AD	US- 3,883,313	05/13/1975	Cullen et al.	
	AE	US- 3,885,978	05/27/1975	Doi et al.	
	AF	US- 3,990,902	11/09/1976	Nishizawa, et al.	
	AG	US- 3,950,504	04/13/1976	Belding et al.	
	AH	US- 4,370,739	01/25/1983	Wang et al.	
	AI	US- 4,755,314	07/05/1988	Sakaguchi et al.	
	AJ	US- 5,138,298	08/11/1992	Shino	
	AK	US- 5,850,410	12/15/1998	Kuramata	
	AL	US- 6,533,874 B1	03/18/2003	Vaudo et al.	
	AM	US- 2003/0188678 A1	10/09/2003	Kokta et al.	
	AN	US- 6,839,362 B2	01/05/2005	Kokta et al.	
	AO	US- 6,844,084 B2	01/18/2005	Kokta et al.	
	AP	US- 3,424,955	01/28/1969	Seiter et al.	
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	AR	US-			
	AS	US-			

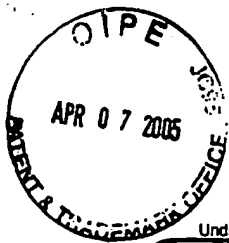
FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T ⁴
		Country Code ³ Number ⁴ Kind Code ⁵ (if known)				
M)	AT	FR 1,471,976	03/24/1966	Siemens Aktiengesellsc.	Corr. 3,424,955	
	AU	JP 11-157997	06/15/1999	Kyocera Corporation	Abstract Only	
	AV	JP 09-278595	10/28/1997	Sumitomo Elect. Ind. Ltd.	Abstract Only	
	AW	JP 62-188325	08/17/1987	Sumitomo Elect. Ind. Ltd.	Abstract Only	
	AX	JP 58-211736	12/09/1983	Toshiba Corporation	Abstract Only	
	AY	JP 07-307316	11/21/1995	Sumitomo Elect. Ind. Ltd.	Abstract Only	

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FOREIGN PATENT DOCUMENTS

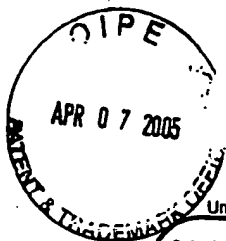
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M	BT	EP 0 762 930 B1	07/12/2000	BP Amoco Corporation		
M	BU	EP 0 263 171 B1	11/25/1992	UOP		
M	BV	WO 01/99155 A2	12/27/2001	Nichia Corporation		
M	BW	WO 02/95887 A2	11/28/2002	SG Ceramics & Plastics Inc.		
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		Examiner Name	Matthew J. Song		
Sheet	3	of	3	Attorney Docket Number	1035-BI4307

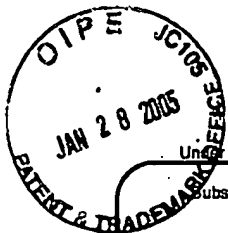
NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
M>	CA	Giess et al., "Growth of Single Crystal MgGa ₂ O ₄ Spinel", IBM TECHNICAL DISCLOSURE BULLETIN, Vol. 15, no. 1, June 1972, pgs 151-152, XP-002315746.	
	CB	Anon., "Spinel Crystals for Electronic Devices", MANUFACTURING TECHNOLOGY NOTE, Vol. NTN-77, no. 0735, April 1977, XP-002315747.	
	CC	Grabmaier et al., "Czochralski Growth of Magnesium-Aluminum Spinel", J. AMERICAN CERAMIC SOCIETY, Vol. 51, no. 6, June 1968, pgs 355-356, XP-002315185.	
	CD	Wyon et al., "Czochralski Growth and Optical Properties of Magnesium-Aluminum Spinel Doped with Nickel", JOURNAL OF CRYSTAL GROWTH, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, Vol. 79, no. 1-3, part 2, 1986, pgs 710-713, XP-002250057.	
	CE	Pinckney, L.R., "Transparent, high strain point spinel glass-ceramics", JOURNAL OF NON-CRYSTALLINE SOLIDS, Vol. 255, pp. 171-177, 1999.	
	CF	Nakamura, S. "Current Status and Future Prospects of InGaN-Based Laser Diodes", ISAP INTERNATIONAL, Vol. 1, pgs. 5-17, 2000.	
	CG	Kisailus D., et al., "Growth of Epitaxial GaN of LiGaO ₂ Substrates Via a Reaction With Ammonia", J. MATER. RES., Vol. 16, no. 7, pgs 2077-2081, 2001.	
	CH	Nakamura, S., et al., "InGaN MQW LDs Grown on MgAl ₂ O ₄ Substrates," In THE BLUE LASER DIODE, (NY: Springer-Verlag), pp. 233-243, 1997 (update included).	
M)	CI	Mordoc, H., et al., "Large-band-gap SiC, III-V nitride, and II-VI ZnSe-based Semiconductor Device Technologies", J. APPL. PHYS., Vol. 76, no. 3, pgs 1363-1398, 1994.	
	CJ		

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PTO/SB/08A (08-03)

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Substitute for form 1449/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 1

of 3

Complete if Known

Application Number	10/669,135
Filing Date	September 23, 2003
First Named Inventor	Milan R. Kokta
Art Unit	1765
Examiner Name	Felisa Carla Hiteshew
Attorney Docket Number	1035-BI4307

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
M)	AA	US- 4,963,520	10/16/1990	Yoo, et al.	
	AB	US- 5,982,796	11/09/1999	Kokta, et al.	
	AC	US- 5,654,973	08/05/1997	Stultz, et al.	
	AD	US- 5,557,624	09/17/1996	Stultz, et al.	
	AE	US- 6,366,596	04/02/2002	Yin, et al.	
M)	AF	US- 6,023,479	02/08/2000	Thony, et al.	
	AG	US-			
	AH	US-			
	AI	US-			
	AJ	US-			
	AK	US-			
	AL	US-			
	AM	US-			
	AN	US-			
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	AP	US-			
	AQ	US-			
	AR	US-			
	AS	US-			

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T ⁶
		Country Code ³ Number ⁴ Kind Code ⁵ (if known)				
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	AU					
	AV					
	AW					
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		Application Number	10/669,135
		Filing Date	September 23, 2003
		First Named Inventor	Milan R. Kokta
		Art Unit	1765
		Examiner Name	Felisa Carla Hiteshew
Sheet 2	of 3	Attorney Docket Number	1035-BI4307

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
M	BA	Efimov, A.N., et al., "Onan Unusual Azimuthal Orientation Relationship in the System Gallium Nitride Layer on Spinel Substrate", CRYSTALLOGRAPHY REPORTS, 45(2): 312-317 (2000).	
	BB	Sun C.J., et al., "Mg-doped green light emitting diodes over cubic (1 1 1) MgAl ₂ O ₄ substrate", APP. PHYS. LETT. 72(19): 2361-2363 (1998).	
	BC	Efimov, A.N., et al., "Symmetry constraints and epitaxial growth on non-isomorphic substrate", THIN SOLID FILMS 260: 111-117 (1995).	
	BD	George, T., et al., "Novel symmetry in the growth of gallium nitride on magnesium aluminate substrates", APPL. PHYS. LETT. 68(3): 337-339 (1996).	
	BE	Sun C.J., et al., "Deposition of high quality wurtzite GaN films over cubic (1 1 1) MgAl ₂ O ₄ substrates using low pressure and metalorganic chemical vapor deposition, " APPL. PHYS. LETT. 68(8): 1129-1131 (1996).	
	BF	Nakamura, S., et al., "Characteristics of InGaN multi-quantum-well-structure laser diodes, " APPL. PHYS. LETT. 68(23): 3269-3271 (1996).	
M	BG	Khan, M.A., et al., "Cleaved cavity optically pumped InGaN-GaN laser grown on spinel substrates," APPL. PHYS. LETT. 69(16): 2418-2420 (1996).	
	BH	Tempel, A., et al., "Nachweis von Stapelfehlern in GaN-Exitaxieschichten mittels Elektronenbeugung," KRISTALL UND TECHNIK 10(7): 741-746 (1975).	
	BI	Tempel, A., et al., "Zur Epitaxie von Galliumnitride auf nichtstoechiometrischem Spinell im System GaC1/NH3/He, " KRISTALL UND TECHNIK 10(7): 747-758 (1975)	
M	BJ	K.V. Yumashev, "Saturable absorber Co ²⁺ : MgAl ₂ O ₃ crystal for Q switching of 1.34-um Nd ³⁺ : YAlO ₃ and 1.54-um Er ³⁺ : glass lasers," APPLIED OPTICS 38(30): 6343-6346 (1999).	

Examiner Signature		Date Considered	4/20/05
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Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Complete if Known	
		Application Number	10/669,135
		Filing Date	September 23, 2003
		First Named Inventor	Milan R. Kokta
		Art Unit	1765
		Examiner Name	Felisa Carla Hiteshe
Sheet 3	of 3	Attorney Docket Number	1035-BI4307

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
m7	CA	Camargo, M.B., et al., "Co2+ Y3Sc2Ga3O12 (YSGG) Passive Q-Switch for Infared Erbium Lasers," submitted to LEOS in 1994.	
	CB	Mikhailov, V.P., et al., "Passive Q-switch performance at 1.3u (1.5u) and nonlinear spectroscopy of Co2+: MgAl2O4 and Co2+: LaMgAl11O9 cyrstals," OSA TOPS VOL. 26 Advanced Solid-State Lasers, pp. 317-324 (1999).	
	CC	Stulz, R.D., et al., "Divalent Uranium and Cobalt Saturable Absorber Q-Switches at 1.5um," OSA Proceedings on Advanced Solid-State Lasers, 24:460-464 (1995).	
	CD	Birnbaum, M., et al., "Co2+: ZnSe Saturable Absorber Q-Switch for the 1.54 Um Er3+: Yb3+: Glass Laser," OSA TOPS Vol. 10 Advanced Solid State Lasers, pp. 148-151 (1997).	
	CE	Machida, H., et al., "difficulties encountered during the Czochralski growth of TiO2 single crystals," JOURNAL OF CYRSTAL GROWTH, 112: 835-837 (1997).	
	CF	Camargo, M.B., et al., "Broad-band 1.54 um Saturable Absorber Q-switch with Co2+, " submitted to ASSL in 1995.	
m7	CG	Yumashev, K.V., et al., "Nonlinear spectroscopy and passive Q-switching operation of a Co2+: LaMgAl11O19 crystal," J. OPT. SOC. AM. B., 16(12): 2189-2194 (1999).	
	CH		
	CI		
	CJ		

Examiner Signature	<i>MAJ</i>	Date Considered	4/21/05
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